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by

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Topic

INTERNET AND RURAL DEVELOPMENT: PROSPECT AND CHALLENGES

INTRODUCTION

The internet has been described as the gateway to a world of seemingly inexhaustible resources. Some refer to it as the information superhighway of unlimited opportunities. Synonymous with the Internet is a new phenomenon (or buzz word) **globalization**, variously used to refer to several things that share a common feature- timelessness. Prominent among this is the notion of the whole world as a 'global village' meaning instant communication with any part of the world. Others (terms) include 'global information infrastructure', 'global shopping', 'global competitiveness', 'global business', and even 'global sex' – pornography on the Internet. The academic community has not been left out. It has been quick to coin its own related appellation – virtual – to refer to the seamlessness of the Internet.

Thus the literature and media are inundated with such phrases as: 'Virtual University', 'Virtual Library', 'Virtual Classroom', 'Virtual Office', etc. This has been extended to include 'Virtual Faculty' and 'Virtual Students'. Other terms used to describe the enormous potential of the Internet include 'cyber', giving a gamut of various applications: 'cyber café', 'cyber space', 'cyber advertising', 'cyber banking' (or cashing) meaning provision of services through the network (Internet).

Evidently, the potential of the Internet is enormous. But what fraction of the human race can get on this information superhighway? Current statistics tend to give a gloom picture. It is estimated that half of world's population still lacks the most basic telecommunications services. One third of the world's population has never made a telephone call. Getting to some specifics, it is also believed that most of these 'deprived population' live in the developing countries and in rural areas. According to the World Bank, two thirds of the world's population lives in developing countries, and in most developing countries 71% of the population live in rural areas, where 75% of the population have no access to the most basic telecommunications.

Here in Nigeria, for instance, a recent study by Nigerian Communications Commission (NCC) reveals that Nigeria has 71% locations that are economically viable for telephone coverage, but 473 (i.e. 67%) out of these are not currently served with basic telephone facilities. We also know that Nigeria has about 0.3:100 telephone density as against ITU's projection of 1:100 ratio for the developing countries by the turn of the century (or millennium). And about 75% of Nigeria's population live in the rural areas.

These statistics led one author and Internet expert to observe that 'global information infrastructure without developing countries is not global'. In the same vein, one may add that information superhighway that bypasses (or does not reach) the rural areas (communities) of the world is not yet super .

At this point, one may ask, what constitutes rural areas (communities)? In the content of present discussion, these may be described as people working or living where circumstances, location, or economics deprive them of any form of connection to the world's telecommunications networks. These include regions where the population is so sparse that the installation of conventional telecommunications infrastructure could not be justified. They also include regions, which are economically depressed. Rural communities are therefore caught up in a vicious circle: lack of good telecommunications hampers resource and economic development of rural areas and communities.

Here lies the challenge to the Internet and to this gathering. How can the Internet facilitate and \ or accelerate rural development?

PROSPECTS:

That the Internet can provide solutions to the dilemma of the rural communities of the world is without doubt. The impact of the Internet is no longer confined to the communications and information industry. It has become a pervasive mass technology with a much wider scope of influence, affecting virtually all sectors of society (2). Outlined below are some of the opportunities the Internet could offer for rural development.

Job Creation

The low cost of communications and accessibility of the global networks means that it is as easy for an individual to reach one person as it is to reach 10 million (2). This offers great possibilities for creating new jobs in the emerging information-based economy particularly for the rural

communities. It also offers the possibility to manage the existing job market in rural areas more efficiently. For the most part, all that it takes is the ability to acquire and transmit information. The potential of the Internet to create new types of jobs and new fields of work in rural areas includes:

- networking opportunities, and on-line job market/matching.
- easy access to data and information on employment by sector, gender and geographical location.
- easy access to the information economics of the world on new types of jobs and new fields of work.

Health:

Computer has made significant inroads in the health care industry and computing systems are now common place in many medical settings. Computer systems are available for individual physicians, as well as for hospitals, and application can be found throughout clinical practice, medical research and medical education. These opportunities and services can easily be brought to the rural communities through the Internet to support doctors, students, hospitals and researchers.

More specifically, it would allow distance diagnosis, medical consultation, analysis, medical courses, research, surgery, access to medical archives and on-line journals to be extended to any rural community around the world.

A classic example is the most recent 'brain surgery by phone' (3). Two surgeons in England carried out a life-saving brain operation after linking up by telephone, on opposite sides of the country. Tyneside neurosurgeon, Robin Sengupa, gave step-by-step instructions over the telephone to consultant surgeon, Chris Metcalfe-Gibson, in Cumbria on the West Coast of England. The telephone link-up saved the life of 27- year – old Mountain Climber, Andrew Elder, who suffered several head injuries after plunging 200 feet down Scafell Pike, England's highest Mountain. We can save and shall be saving millions of lives in rural areas around the world in this way every hour, every day, every year.

'Distance Learning' (DL), 'Virtual University', 'Virtual Classrooms', and so on have become very familiar terms and expressions for education in 'cyber space'. These technologies offer great hopes for improved education in rural areas through access to:

- latest technologies to support professional development
- necessary tools to address the needs of different learner groups.
- highly qualified instructors and teachers around the world.
- appropriate teaching / learning materials at any part of the world.
- renowned educational planners and policy makers in any part of the world for necessary consultation to ensure relevant developments and implementation of directives and regulations.

Trade and Commerce:

The ability to acquire store and transmit information has become the most powerful new currency of economic exchange throughout the world (4). Marketing, public relations, shopping, market research, sales and support could all now be conducted on the Internet. These rural communities could now trade and do business with any part of the world through the Internet and local electronic networks.

Farming:

The opportunities include:

- access to new techniques for improving agricultural production.
- efficient marketing of agricultural products through information and telecommunications network.
- more efficient distribution.
- monitoring market performance and measuring market trends.
- easy and greater access to agricultural inputs and government policies, assistance, and so on.

Rural Integration:

The internet has enormous potential as a tool for integrating rural areas into the national economy by providing access to public services such as education, healthcare and environmental protection awareness programs. In the 'brain surgery by phone' example cited above, for instance, the West Cumberland Hospital in Whitehaven, where the surgery was performed, is geographically remote and hours (by any local transport) from a neurosurgical center at Newcastle General Hospital, from where the neurosurgeon, Robin Sengupta, was giving the live-saving surgical instructions.

Challenges

The challenges then are how can rural areas be brought to the ‘promise’ of the Internet? Simply put, why not **Rural Area Networks**, not only to cater for the needs and interests of rural Communities, but also to promote rural development and integration? We are very familiar with various kinds of networks (WAN,MAN, LAN, Industrial Net, Educational Net, Research Net, Intranet, Extranet, etc) interconnecting various kinds of groups and interests and to the Internet. For long many societies have been paying lip services to rural integration. Without doubt, rural integration is better achieved and served through rural area networks. Rural Area Networks (RAN) may not require developing new technologies or differ significantly from known networks (in terms of hardware, software, topology or architecture). But it may necessarily differ in at least two particular areas: brainware and technology support network (or net): By brainware and technology support net (TSN) we mean:

- **Brainware:** the purpose (objectives and goals), the application, and the justification of hardware and software deployment, the know-why of the network (TSN):what to employ, how , where and why?
- **Technology Support Net:** consists of the requisite organizational, informational, and cultural structures to support the proper use and functioning of the network (RAN) forwards the stated goals and objects – meeting special needs of rural communities. More specifically these include requisite skills, work content, formal and informal covenants of the work system standards and measures, management styles, and cultural organizational patterns, and so on.

Let us look more closely to a few of the above definition to illustrate our point.

What to Employ: Technological Features.

This concerns choice of technology (or technologies and their combination). The roll out new technologies, particularly in telecommunications, leading towards intelligent networks, is a universal phenomenon matching the globalized needs of commerce, finance, industry and the larger society. Some of these technologies, particularly in the wireless and digital domain, provide useful options for rural areas as they enable:

- reduced cost of installation and reconfiguration, due to the elimination of requirements to serve terrestrial needs (digging, trenching, security, etc).
- improved speed of deployment and reconfiguration to meet priority needs of rural communities.
- greater mobility and portability (e.g. cordless telephony, cellular radio and packet radio data networks).

Why? Justification:

It is necessary to conduct studies on how the network (RAN and Internet) can improve the lot of particular rural communities.

Particularly, since the rural population are predominantly rural farmers, how can the deployed technology (RAN, Internet) help these farmers improve their:

- productivity: crop yields, reduced wastage, etc.
- access to health: telemedicine.
- access to information around them and beyond: telecentres.
- access to agricultural inputs, government assistance, international development programs and aids, improved farming methods, etc.

Standards and Measures

Rural communities have different views of such important network features as spread (of operation) and time. Some cultures are time conscious. Others take their time. In some instances time may be critical, like the ‘brain surgery by phone’ – where the right information at the right time helped to save the live of the man with multiple head injuries. In essence rural area networks are to be adapted to the standards and life patterns of individual rural communities. This demands greater flexibility in the adoption known (existing) standards and measures.

Achievable Goals and Objectives

Rural communities are used to visible results and tend to be impatient with reotherics, bureaucratic red tepism and bottlenecks.

Therefore visibility of set goals and objectives is a very critical factor for the success of rural networks. More specifically, rural networks must be seen to

- promote rapid rural development – socio-economic wellbeing, health standards, education (literacy level), etc
- enhance existing cultural and life patterns and social lives.
- Encourage and improve the use of new technologies to improve themselves
- Improve existing ways of doing things (trade, healthcare, etc)

Implementation: How?

Many a time, who introduces new technologies or bring assistance to certain societies tend to implement their own programs, rather than programs oriented towards solving the needs and programs of the recipients. Rural networks must therefore address priority needs of rural communities, perhaps starting with:

- creating general awareness of the need of the Internet to the communities
- developing requisite skills for the running of the network – capacity building
- developing necessary physical infrastructures – power (generators), community centers for telecentres, telemedicine, tele-education, etc.
- providing necessary technical support (spare parts, advice, etc).
- mass mobilization – as many members of every community as possible should be involved at various stages of project implementation in order to avoid rejection or resistance.
- content development – this may involve developing special software, instructional materials and user friendly interfaces tailored to the needs, culture and life styles of rural communities.
- group needs, rather than individual needs, are to be pursued for at least economy of scale, easy management, social life patterns, etc. For instance, our concept of needs of networks is to be translated into community centers (community telephones, community servers, community radios, community healthcare centers / telemedicine, community working center/teleworking, community information centers / telecentres, etc).

-Funding

This is the bottom line of the challenge. Who should fund rural area networks and how? Because rural communications are considered to be at the lowest socio-economic level of society, the best approach that comes to mind would outright external aid. This may be necessary in certain communities. But greater flexibility, mobilization and combination of efforts and resources may yield greater results and impacts. We are familiar with community development mobilized. These should be a useful source. Counterpart funding by local, state and national governments in another source, through this has been found not to be reliable. Because of political instability, and ever changing and unreliable government policies many developments projects have failed because of lack of government commitment to counterpart funding. External international aids are another sure source, provided these are properly channeled and supervised to avoid government diversion. Regional/zonal collaborations have been found to be another source, though not very reliable due to the involvement of government organizations world-wide have also be found to be very useful and effective. Their contributions shall go along way, technically, financially, and management wise.

-Management

Another important question is how to or who should manage or run rural networks? Borrowing from experience, the beneficiaries (rural communities) are to be involved at every management stage of the project, administratively and technically: particularly in the areas of management stage of the project, administratively and technically: particularly in the areas of

- choice of technology
- installation
- operation
- maintenance
- organization
- decision making

this will ensure, among other things, acceptability, continuity and sustainability.

CONCLUSION

The Internet holds great promise for rural development. The great potential of the Internet should be harnessed and tailored to the needs of rural communities of the world.

This could be achieved through special Rural Area Networks (RAN). The necessary technologies to implement are already

available world-wide. What is needed is the will and determination to see this through. Rural Area Networks are possible, achievable, cost-effective result oriented, practical and realistic. Let us join hands to tackle rural poverty through the Internet and information networking.

We are doing something in this direction at the Computer Communications Center, University of Nigeria, Nsukka. Starting from known to unknown, we are conducting studies on performance of Corporate Computer Networking (LAN, WAN). A survey conducted among ten large corporate bodies: oil companies, finance houses (Banks and Insurance) and government parastatals, which have operational networks, have revealed the following factors as having significant effects on corporate Networks performance:

- physical infrastructure – power supply (regularity and quality)
- environmental factors 0- temperature, dust industrial effluents
- system design – system upgrades and customized
- Network architecture – topology, segmentation , backbone, access methods,
- Public Networks: NITEL – signaling, non-availability, quality of line, bandwidth, Corruption politics, cost (costly leased line)
- Implementation and Operational factors – Physical structures (buildings) , hierarchy of management, cable work

(trunking or not) maintenance, technical know – how of contractors and consultants, adaptability of design etc.

- Human factors – Training, job satisfaction, incentives, educational background, exposure and experience.

One of the major objectives of the study now is to isolate systemic (hardware, software, infrastructures) from socio- technical factors. For instance, human factors have been found to exert more significant effect on corporate network performance than the actual technology (hardware and software). Such factors include: wrong choice of technology due to non-technical influence (the Nigerian factor), lack of technical skills and experience (most corporate bodies that now have operational networks do not have resident network engineers or other computer professionals, they depend largely on external consultants most of whom are ill qualified and not experienced). The experience gained in these studies could be imported to rural networks.